10.7 RAW COOLING WATER SYSTEM

10.7.1 Power Generation Objective

The objective of the Raw Cooling Water System 024 is to remove heat from turbine-associated equipment and accessories located in and adjacent to the Turbine Building, from the Reactor Building Closed Cooling Water heat exchangers, and from other reactor-associated equipment that utilizes raw cooling water.

10.7.2 Power Generation Design Basis

1. The system shall be capable of supplying the flow requirements of the equipment it serves during the full range of operation.

2. Under loss of power conditions the system shall not be required to perform any essential function, but shall be available for equipment protection and to facilitate restarting.

3. After a design basis accident the system shall not be required for safe shutdown.

10.7.3 Description

The Raw Cooling Water System (shown in Figures 10.7-1a sheets 1, 2, and 3 and 10.7-1b sheets 1, 2, 3, 4, 5, 6, and 7) furnishes cooling water to the following:

a. Turbine lube oil coolers,
b. Generator stator water coolers,
c. Generator hydrogen coolers,
d. Reactor feed pump turbine oil coolers,
e. Service and control air compressors,
f. Steam jet air ejector precoolers,
g. Generator exciter air coolers,
h. Air-conditioning condensers,
i. Recirculation pump VFDs Heat Exchangers,
j. Reactor Building Closed Cooling Water heat exchangers,
k. Condensate booster pump motor heat exchanger and
l. Other miscellaneous coolers
m. Condensate booster pump motor heat exchanger (Unit 2)
n. Condensate booster pump motor heat exchanger (Unit 3)

There are 12 main Raw Cooling Water System pumps, located in the Turbine Building at elevation 557 ft., and they are supplied with river water from the condenser circulating water conduits of each unit, which is passed through fine

mesh strainers. The suction headers for Units 1 and 2 are interconnected. The Unit 3 suction header is served separately due to physical limitation. Three pumps are required per unit and one is provided as a spare for Units 1 and 2. There is a total of 5 RCW pumps in Unit 3. All pumps discharge into a common header. Automatic temperature controls are provided for most of the coolers supplied by the Raw Cooling Water System. The system control diagram is shown in Figures 10.7-2 sheets 1, 2, 3, 4, 5, and 6.

Under loss of power conditions two of the 12 raw cooling water pumps (1D & 3D) may be operated, powered by standby diesel generators, but only if standby diesel-generated power reserve margin is available. They would supply water to selected turbine auxiliary equipment to prevent over heating and subsequent equipment damage and to assist getting back into operation. The booster pumps are not required at this time. The raw cooling water pumps are not started automatically in the loss-of-power mode since they are not required for safe shutdown. The automatic start feature is also defeated when offsite power is available in the design basis accident mode to minimize the loading on the safety-related buses. RCW pump 1D is tripped by the Common Accident Signal Logic to prevent overloading 4kV Shutdown Bus 1. As ECCS pumps are secured and loads are reduced on the 4kV Shutdown Buses, the RCW pump may be manually re-started by operators as desired to support long term post accident recovery and shutdown of the non-accident units.

A backup cooling water supply for the Reactor Building Closed Cooling Water heat exchangers and control air compressors is provided from the Emergency Equipment Cooling Water System 067. The EECW system automatically supplies water in place of raw cooling water if the Reactor Building Closed Cooling Water System or Air Compressor System raw cooling water pressure is lost when EECW header pressure is above a specified minimum pressure.

There are four cooling water inlet penetrations of secondary containment, each meeting seismic Class II pressure boundary retention requirements.

Raw cooling water is chemically treated consistent with NPDES permit limitations. In accordance with NRC Bulletin 81-03, raw cooling water is also chemically treated during peak clam spawning periods to ensure clam control.

10.7.4 Inspection and Testing

No special tests are required. Routine visual inspection of the system components, instrumentation, and trouble alarms are adequate to verify system operability.